Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

**1. (currently amended)** : A method ~~for the~~ of fourth-order, blind identification of ~~at least~~ two sources in a system ~~comprising~~ including a number of sources P and a number N of reception sensors receiving the observations, ~~said~~ the sources having different tri-spectra, ~~wherein the method~~ ~~comprises~~ comprising ~~at least~~ the following steps:

a) ~~a step for the~~ fourth-order whitening of the observations received on the reception sensors in order to orthonormalize the direction vectors of the sources in the matrices of quadricovariance of the observations used,

b) ~~a step for the~~ joint diagonalizing of several whitened matrices of quadricovariance ~~(step a) in order~~ to identify the spatial signatures of the sources.

**2. (currently amended):** [[A]] The method according to claim 1, wherein the observations used correspond to the time-domain averaged matrices of quadricovariance defined by:

$$Q_x(\tau_1,\tau_2,\tau_3) = \sum_{p=1}^{P} c_p(\tau_1,\tau_2,\tau_3)\,(\boldsymbol{a}_p \otimes \boldsymbol{a}_p^{\,*})\,(\boldsymbol{a}_p \otimes \boldsymbol{a}_p^{\,*})^{\mathrm{H}} \qquad (4a)$$

$$= A_Q\; C_s(\tau_1,\tau_2,\tau_3)\; A_Q^{\;\mathrm{H}} \qquad (4b)$$

where $A_Q$ is a matrix with a dimension ($N^2$ x $P$) defined by $A_Q = [(\boldsymbol{a}_1 \otimes \boldsymbol{a}_1^*), \ldots., (\boldsymbol{a}_p \otimes \boldsymbol{a}_p^*)]$, $C_s(\tau_1,\tau_2,\tau_3)$ is a diagonal matrix with a dimension ($P$ x $P$) defined by $C_s(\tau_1,\tau_2,\tau_3) = \mathrm{diag}[c_1(\tau_1,\tau_2,\tau_3),\ldots, c_p(\tau_1,\tau_2,\tau_3)]$ and $c_p(\tau_1,\tau_2,\tau_3)$ is defined by:

$$c_p(\tau_1,\tau_2,\tau_3) = \langle \mathrm{Cum}(s_p(t),\, s_p(t-\tau_1)^*,\, s_p(t-\tau_2)^*,\, s_p(t-\tau_3)) \rangle \qquad (5)$$

**3. (currently amended):** [[A]] The method according to claim 2, ~~comprises at least~~ comprising the following steps:

**Step 1:** [[the]] ~~estimation~~ estimating, through $\hat{Q}_x$, of the matrix $Q_x$, from the $L$ observations $x(lT_e)$ using a non-skewed and asymptotically consistent estimator.

**Step 2:** [[the]] eigen-element decomposition of $\hat{Q}_x$, the estimation of the number of sources $P$ and the limiting of the eigen-element decomposition to the $P$ main components:

$\hat{Q}_x \approx \hat{E}_x \hat{\Lambda}_x \hat{E}_x^H$, where $\hat{\Lambda}_x$ is the diagonal matrix containing the $P$ eigenvalues with the highest modulus and $\hat{E}_x$ is the matrix containing the associated eigenvectors.

**Step 3:** [[the]] building of the whitening matrix: $\hat{T} = (\hat{\Lambda}_x)^{-1/2} \hat{E}_x^H$.

**Step 4:** [[the]] ~~selection~~ selecting [[of]] $K$ triplets of delays $(\tau_1^k, \tau_2^k, \tau_3^k)$ where $|\tau_1^k| + |\tau_2^k| + |\tau_3^k| \neq 0$.

**Step 5:** ~~the estimation~~ estimating , through $\hat{Q}_x(\tau_1^k, \tau_2^k, \tau_3^k)$, of the $K$ matrices $Q_x(\tau_1^k, \tau_2^k, \tau_3^k)$.

**Step 6:** ~~the computation~~ computing of the matrices $\hat{T}\ \hat{Q}_x(\tau_1^k, \tau_2^k, \tau_3^k)\ \hat{T}^H$ and the estimation, by $\hat{U}_{sol}$, of the unitary matrix $U_{sol}$ by the joint diagonalizing of the $K$ matrices $\hat{T}\ \hat{Q}_x(\tau_1^k, \tau_2^k, \tau_3^k)\ \hat{T}^H$

**Step 7:** [[the]] ~~computation~~ computing [[of]] $\hat{T}^{\#} \hat{U}_{sol} = [\hat{\boldsymbol{b}}_1 \ldots \hat{\boldsymbol{b}}_P]$ and the building of the matrices $\hat{B}_l$ sized $(N \times N)$.

**Step 8:** [[the]] ~~estimation~~ estimating , through $\hat{\boldsymbol{a}}_P$, of the signatures $a_q$ $(1 \leq q \leq P)$ of the $P$ sources in applying a decomposition into elements on each matrix $\hat{B}_l$.

4. (currently amended): [[A]] The method according to claim 1 ~~to 3~~, comprising ~~at least one step for the evaluation~~ evaluating ~~of the~~ quality of the identification of the associated direction vector in using a criterion ~~such as~~:

$$\mathrm{D}(A, \hat{A}) = (\alpha_1, \alpha_2, \ldots\ldots, \alpha_P) \tag{16}$$

where

$$\alpha_p = \min_{1 \leq i \leq P} [\mathrm{d}(\boldsymbol{a}_p, \hat{\boldsymbol{a}}_i)] \tag{17}$$

and where $\mathrm{d}(\boldsymbol{u}, \boldsymbol{v})$ is the pseudo-distance between the vectors $\boldsymbol{u}$ and $\boldsymbol{v}$, such that:

$$\mathrm{d}(\boldsymbol{u}, \boldsymbol{v}) = 1 - \frac{|\boldsymbol{u}^H \boldsymbol{v}|^2}{(\boldsymbol{u}^H \boldsymbol{u})(\boldsymbol{v}^H \boldsymbol{v})} \tag{18}$$

**5. (currently amended):** [[A]] The method according to claim 1, ~~comprising at least one step of~~ a fourth-order cyclical after the step a) of fourth-order whitening.

**6. (currently amended):** [[A]] The method according to claim 5, wherein the identification step is performed in using fourth-order statistics.

**7. (currently amended):** [[A]] The method according to claim 1 wherein the number of sources P is greater than or equal to the number of sensors.

**8. (currently amended):** [[A]] The method according to claim 1, comprising ~~at least one step of~~ goniometry using the identified signature of the sources.

**9. (currently amended):** [[A]] The method according to claim 1, comprising ~~at least one step of~~ spatial filtering after the identified signature of the sources.

**10. (currently amended):** [[A]] The use of the method according to claim 1, for use in a communications network.

**11. (new):** The method according to claim 2, comprising evaluating quality of the identification of the associated direction vector in using a criterion

$$D(A, \hat{A}) = (\alpha_1, \alpha_2, \ldots\ldots, \alpha_P)$$

where

$$\alpha_p = \min_{1 \leq i \leq P} [d(\boldsymbol{a}_p, \hat{\boldsymbol{a}}_i)]$$

and where $d(\boldsymbol{u}, \boldsymbol{v})$ is the pseudo-distance between the vectors $\boldsymbol{u}$ and $\boldsymbol{v}$, such that:

$$d(\boldsymbol{u}, \boldsymbol{v}) = 1 - \frac{|\boldsymbol{u}^H \boldsymbol{v}|^2}{(\boldsymbol{u}^H \boldsymbol{u})(\boldsymbol{v}^H \boldsymbol{v})}$$

**12. (new):** The method according to claim 3, comprising evaluating quality of the identification of the associated direction vector in using a criterion

$$D(A, \hat{A}) = (\alpha_1, \alpha_2, \ldots\ldots, \alpha_P)$$

where

$$\alpha_p = \min_{1 \leq i \leq P} [d(\boldsymbol{a}_p, \hat{\boldsymbol{a}}_i)]$$

and where $d(\boldsymbol{u}, \boldsymbol{v})$ is the pseudo-distance between the vectors $\boldsymbol{u}$ and $\boldsymbol{v}$, such that:

$$d(\boldsymbol{u}, \boldsymbol{v}) = 1 - \frac{\left|\boldsymbol{u}^{H}\boldsymbol{v}\right|^2}{\left(\boldsymbol{u}^{H}\boldsymbol{u}\right)\left(\boldsymbol{v}^{H}\boldsymbol{v}\right)}$$

**13. (new):** The method according to claim 2, a fourth-order cyclical after the step a) of fourth-order whitening.

**14. (new):** The method according to claim 2, wherein the identification step is performed in using fourth-order statistics.

**15. (new):** The method according to claim 2, wherein the number of sources P is greater than or equal to the number of sensors.

**16. (new):** The method according to claim 2, comprising goniometry using the identified signature of the sources.

**17. (new):** The method according to claim 3, a fourth-order cyclical after the step a) of fourth-order whitening.

**18. (new):** The method according to claim 3, wherein the identification step is performed in using fourth-order statistics.

**19. (new):** The method according to claim 3, wherein the number of sources P is greater than or equal to the number of sensors.

**20. (new):** The method according to claim 3, comprising goniometry using the identified signature of the sources.